

During synapsis McALLISTER finds that there is a lateral pairing and fusion of spirems, the fusion being complete at the time of the recovery from synapsis. After this recovery there is a second contraction stage. The double heterotypic chromosomes are formed, not by the approximation of the limbs of loops, but by a transverse segmentation of a longitudinally split spirem, the line of the split probably representing the line of approximation of the two parental spirems seen at synapsis.

The heterotypic and homotypic mitoses in the megaspore mother cell result in the formation of four megaspores, separated by plasma membranes. The membrane formed at the heterotypic mitosis persists, while those formed at the homotypic mitosis quickly break down. From the inner binucleate cell, thus formed, an 8-nucleate embryo sac is developed. Consequently, two megaspores are concerned in the development of the embryo sac.

Adventitious embryos develop from nucellar cells in the micropylar region, and one or more of them may become mature. The presence of pollen tubes indicates that embryos may also result from fertilization.—CHARLES J. CHAMBERLAIN.

**Marine algae.**—BORGENSEN<sup>12</sup> has published an account of the marine Chlorophyceae of the Danish West Indies, based upon collections made in 1892, 1895, and 1905. The list contains 34 genera including 86 species, 4 new species being described in *Cladophora* (2), *Avrainvillea*, and *Pringsheimia*. The full field notes and the numerous illustrations make the account an exceedingly satisfactory one.

BORGENSEN<sup>13</sup> has also given an account of the species of *Sargassum* collected during his three visits to the Danish West Indies, partly along the coasts of the islands, and partly in the Sargasso Sea. The shore collections include 4 species, while the pelagic collections are all referred to two species. The discussion of the "biology, affinities, and origin of the gulfweed" is especially interesting. The conclusions reached are that the gulfweed of the Sargasso Sea consists of two species, *S. natans* (most common) and *S. Hystrix*, var. *fluitans*; that they are true pelagic algae, living perennially on the open sea; and that most probably they have descended from shore forms of the West Indies and the neighboring American coast. The author says "it is of great interest that we have an instance of floating, pelagic species of such a high alga type as *Sargassum*; because, as is well known, the higher types of algae are as a rule attached, and if detached they perish sooner or later."—J. M. C.

---

<sup>12</sup> BORGENSEN, F., The marine algae of the Danish West Indies. Part I. Chlorophyceae. Dansk Botanisk Arkiv 1: no. 4. pp. 158. figs. 126 and chart. 1913. Copenhagen: H. Hagerup. Kr 4.

<sup>13</sup> ———, The species of *Sargassum* found along the coasts of the Danish West Indies, with remarks upon the floating forms of the Sargasso Sea. Mindeskrift for Japetus Steenstrup. pp. 20. figs. 8. 1914.